

FIG. 1 (PRIOR ART)

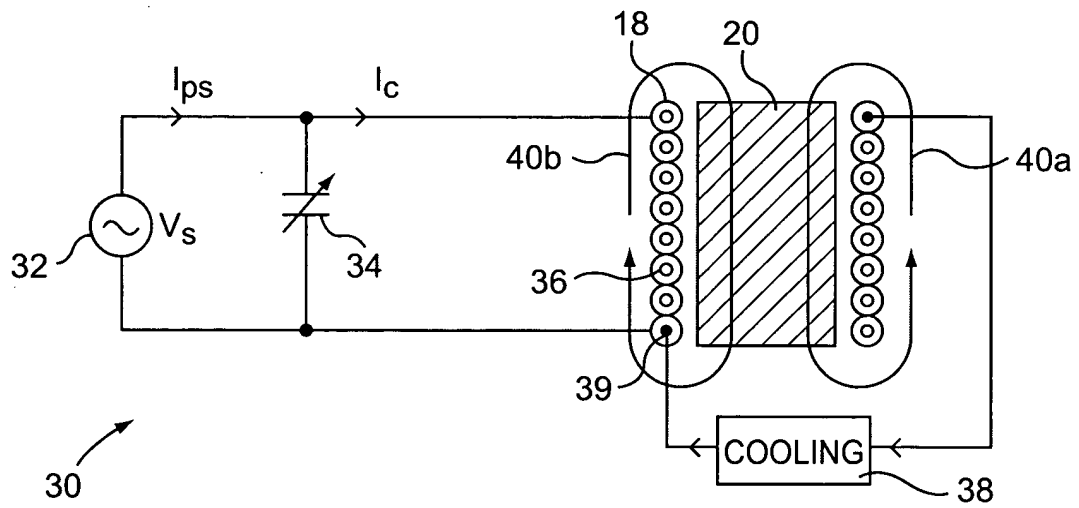
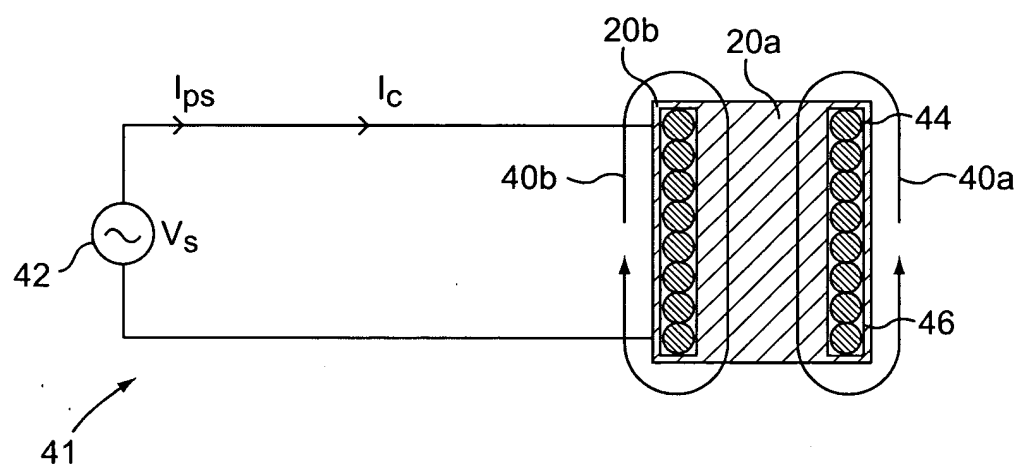


FIG. 2 (PRIOR ART)

FIG. 3

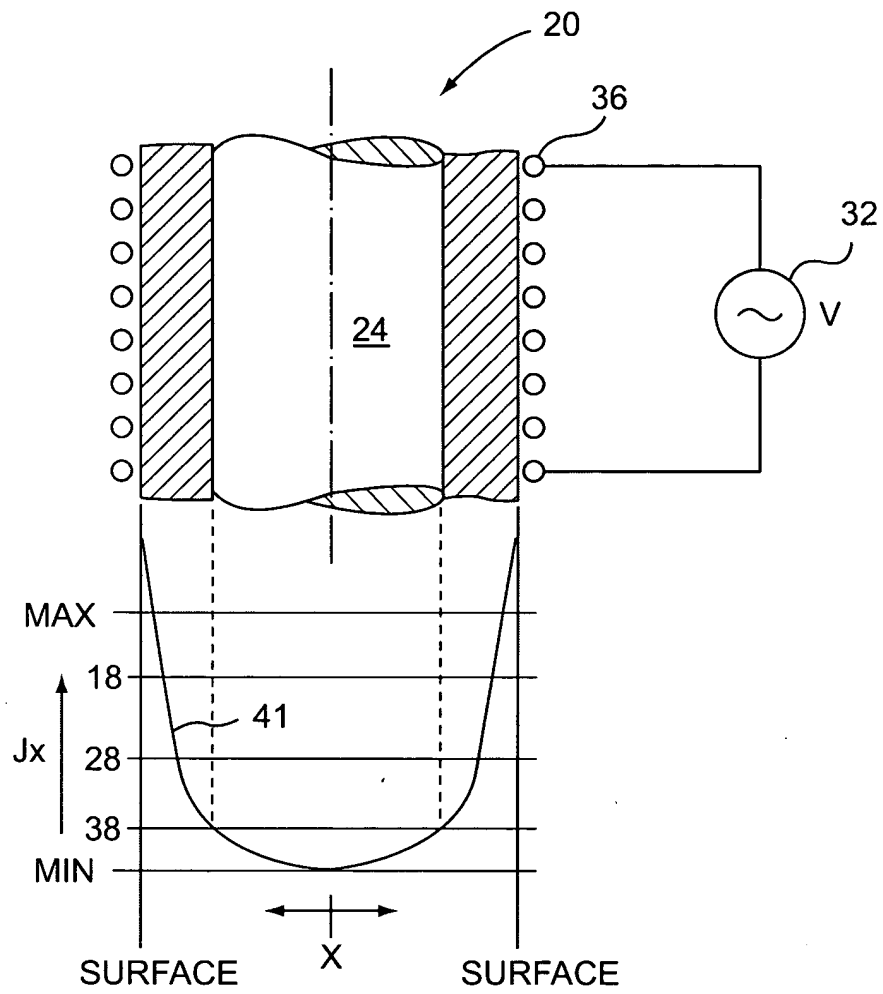


FIG. 3A

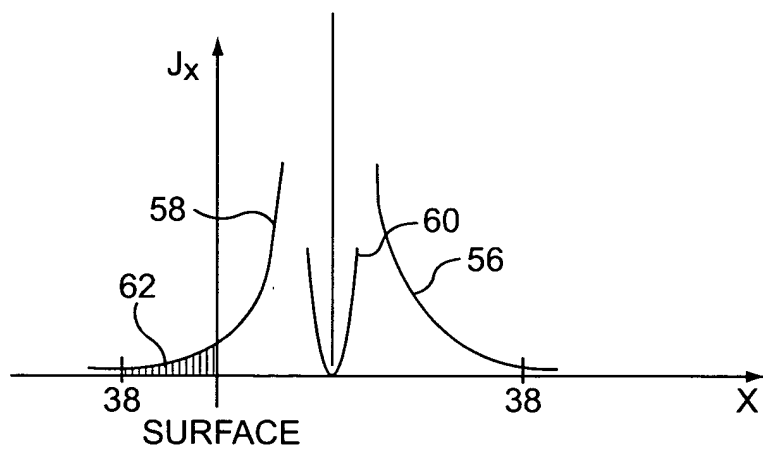


FIG. 3C

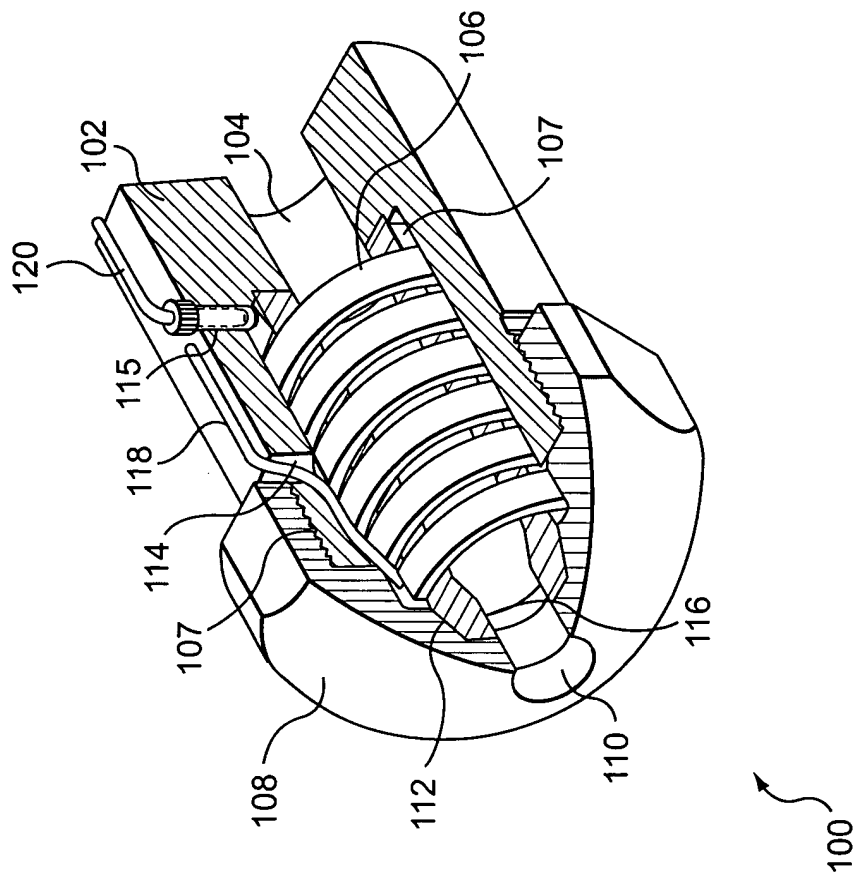


FIG. 4

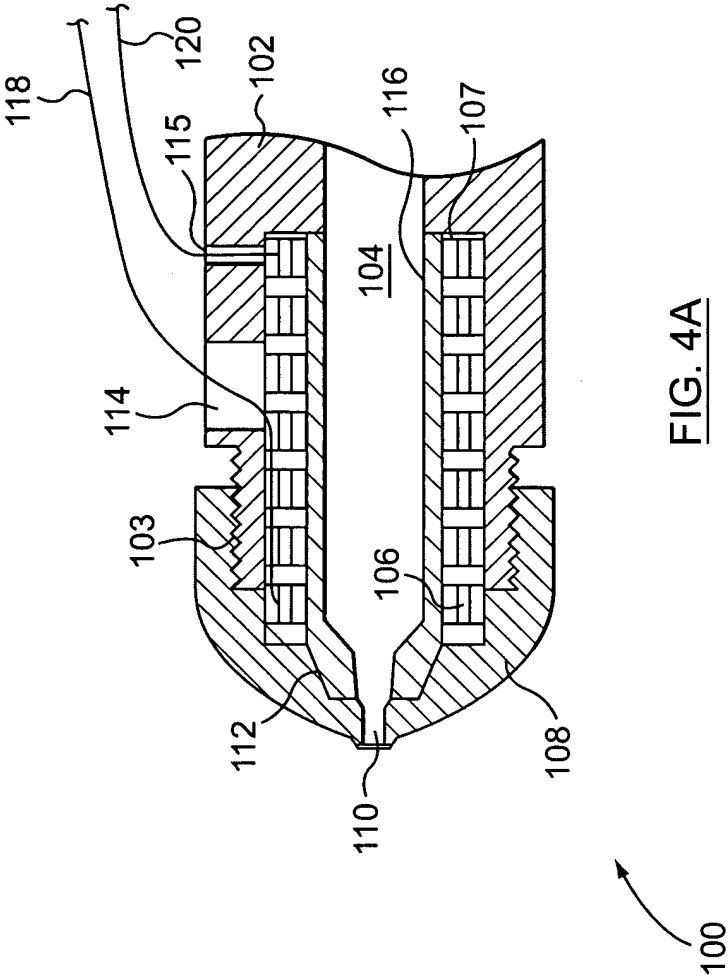


FIG. 4A

Design Criteria	Inductive Heater (FIG.2)	Resistive Heater (FIG.1)	Combo Heater (FIG.3)
Placement of coil.	Spaced away from heated article.	Wrapped around heated article.	Placed inside grooves of heated article to provide closed magnetic path.
Coil resistance	Low (ie. Cu)	High (ie. NiCr)	High (ie. NiCr)
Thermal Communication of Coil with Heated Article.	No-coil heat is removed by special cooling.	Yes-coil heat is conducted to article.	Yes-heat is conducted to article and no special cooling required.
Power Supply Characteristics.	High Frequency-resonance filter required.	Line Frequency-no filter required.	High Frequency-no resonance filter required.
Max. Heating Power.	$P_I = I_{l(max)}^2 \times R_{eq}$	$P_I = I_{R(max)}^2 \times R_R$	$P_{combo(max)} = P_{R(max)} + P_{I(max)}$
Min. Time of Heating.	$t_{l(min)} = (cMDT)/P_{I(max)}$	$t_{R(min)} = (cMDT)P_{R(max)}$	$t_{combo(min)} = (cMDT)/(P_{R(max)} + P_{I(max)})$
Coil Energy Losses.	$P_{l(loss)} = (I_{l(max)}^2 R_c) + P_{(cool sys)}$	$P_{R(loss)} = 0$	$P_{combo(loss)} = 0$

FIG. 5

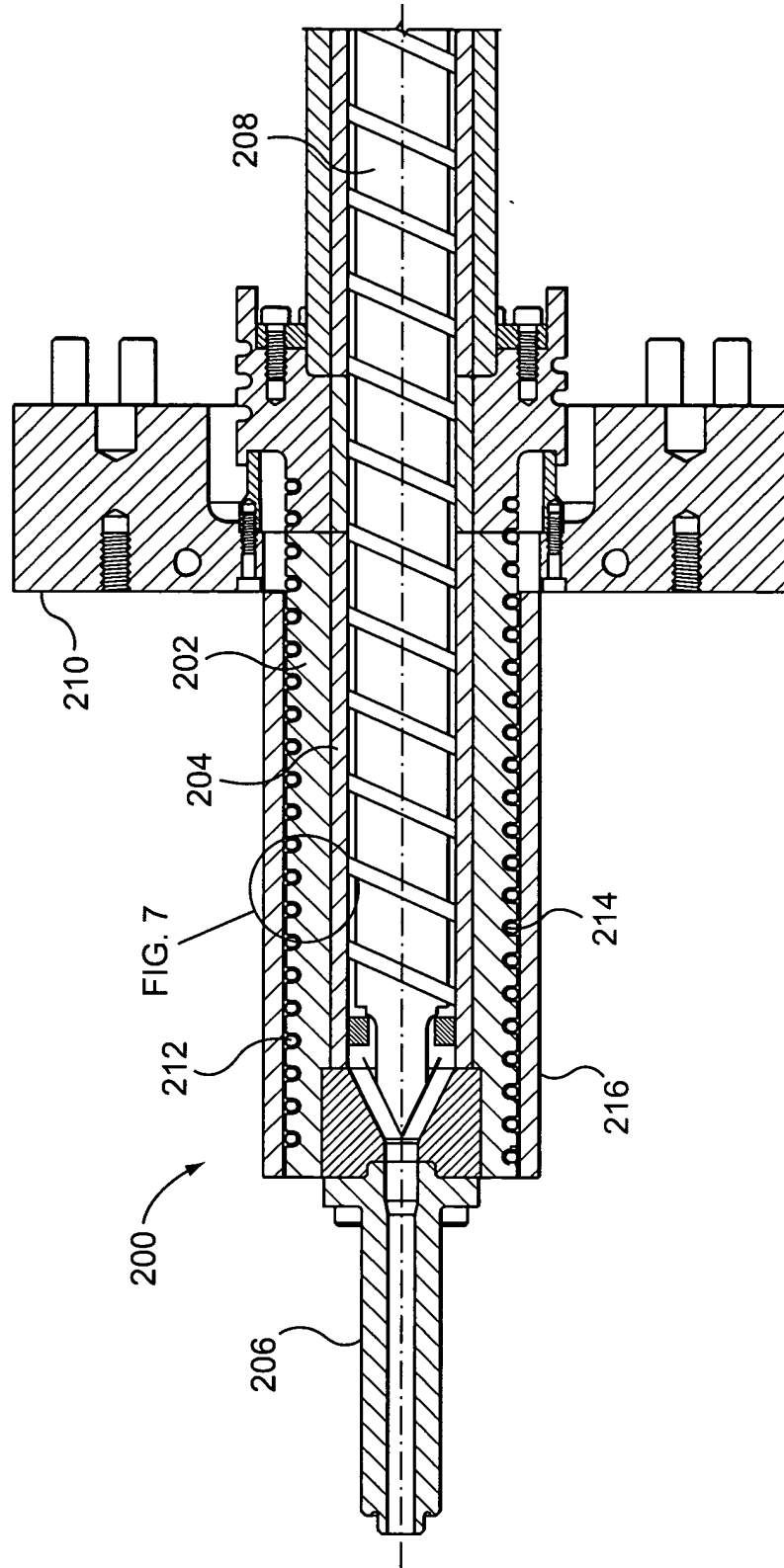


FIG. 6

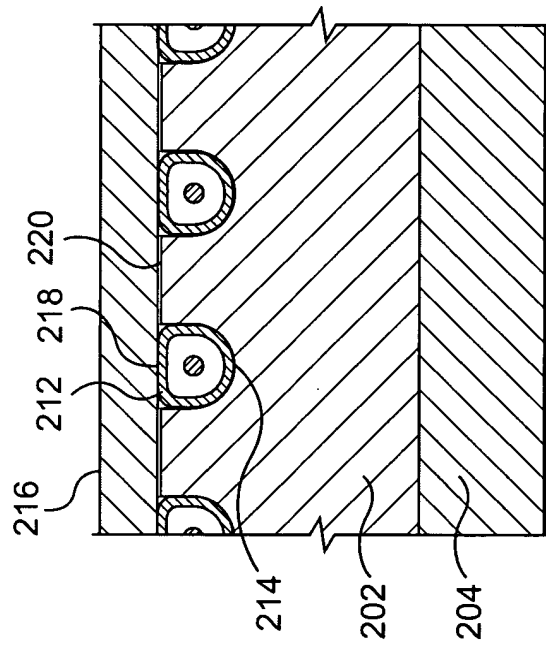


FIG. 7

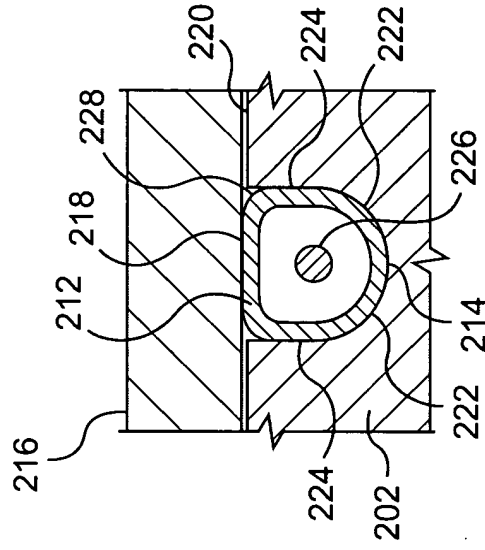


FIG. 8

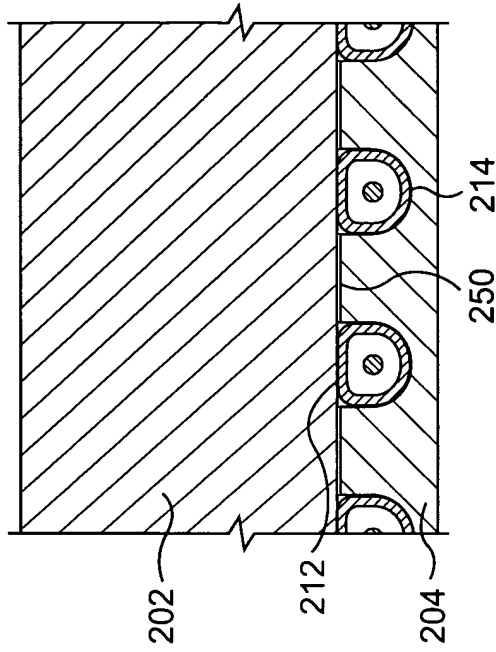


FIG. 10

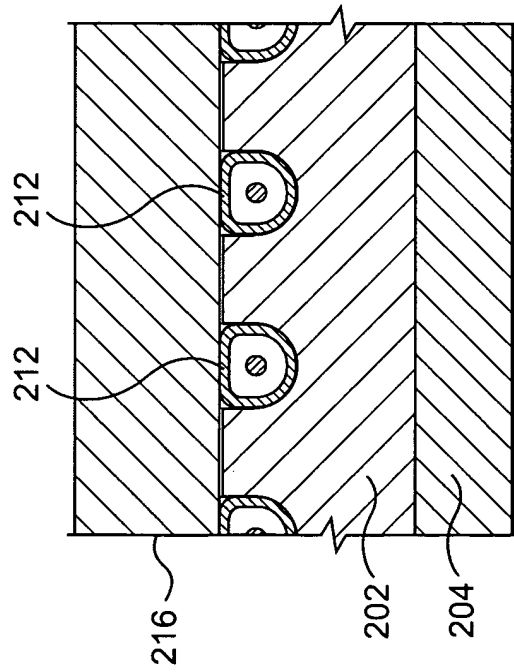


FIG. 9

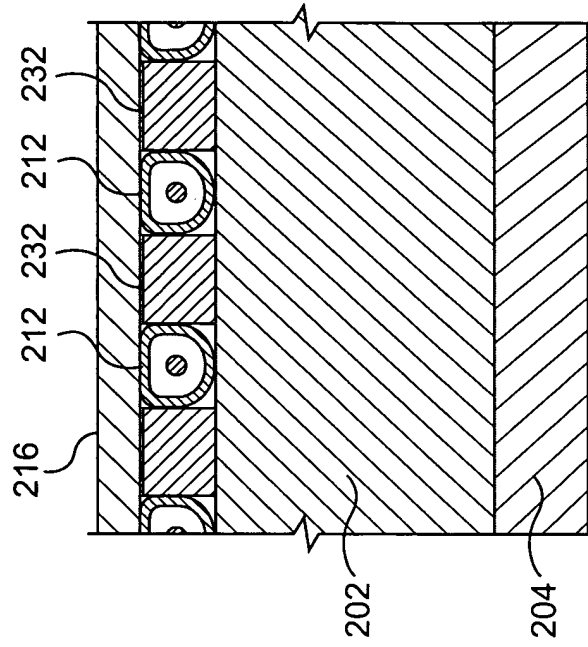


FIG. 12

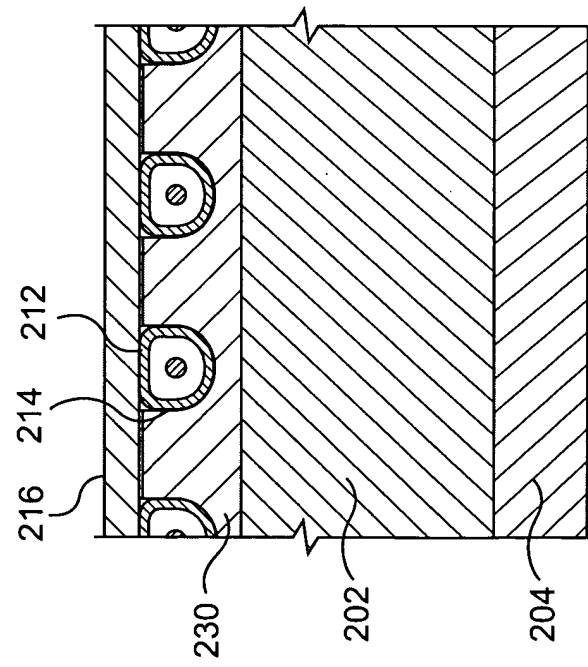


FIG. 11

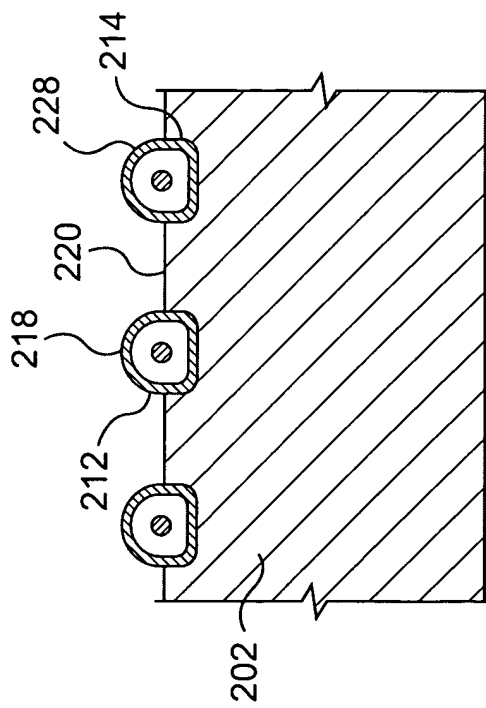


FIG. 13

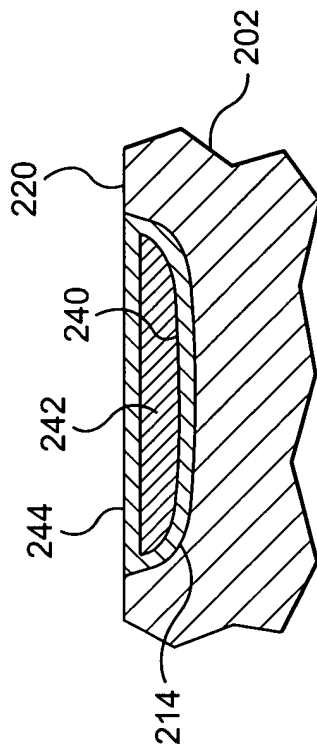


FIG. 14

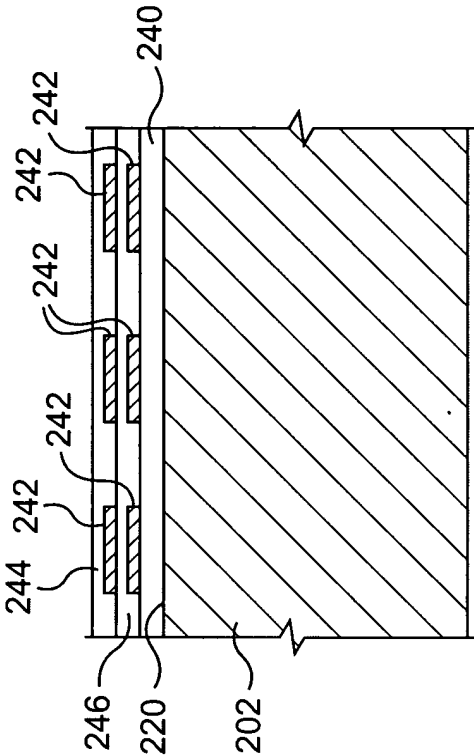


FIG. 15